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- (71) Applicant (for all designated States except US): **ALGETA**
AS [NO/NO]; P.O.Box 54, Kjelsås, N-0411 Oslo (NO).
- (71) Applicant (for GB only): **GODDARD, Chris** [GB/GB];
Frank B. Dehn & Co., 179 Queen Victoria Street, London
EC4V 4EL (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **SALBERG, Gro**
[NO/NO]; Egnehemun 27, N-0196 Oslo (NO). **LARSEN,**
Roy [NO/NO]; Lunden 20, N-0598 Oslo (NO).
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(54) Title: **ALPHA-EMITTING HYDROXYAPATITE PARTICLES**

(57) Abstract: The present invention provides Hydroxyapatite (HA) incorporating an alpha-emitting radionuclide or an *in vivo* generator for an alpha-emitting radionuclide. The invention further provides methods for the formation of such HA, pharmaceutical compositions comprising the HA and methods of medical treatment of cancerous or noncancerous disease including administering the HA or compositions thereof.